

Claims

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is as follows:

1 1. A microwave water heating system, comprising:
2 a metal casing having a casing outer wall defining a casing chamber;
3 an inner housing positioned in said casing chamber, said inner housing having an inlet
4 port for connection to an upstream water source and having an outlet port, said
5 inner housing being spaced apart from said casing outer wall with a vacuum
6 space; and
7 a magnetron mounted to said casing outer wall for transmission of microwaves through
8 said vacuum space and into said inner housing for heating water therein.

1 2. The microwave water heating system as in claim 1 wherein:
2 said casing outer wall defines first and second openings;
3 said inlet port extends through said first opening and said outlet port extends through
4 said second opening.

1 3. The microwave water heating system as in claim 1 wherein said inner housing
2 includes a nozzle in fluid communication with said outlet port for delivering a water stream
3 from said housing to said outlet port.

1 4. The microwave water heating system as in claim 3 wherein said nozzle is a
2 bell nozzle for efficient flow of said water stream.

1 5. The microwave water heating system as in claim 1 wherein said inner housing
2 includes a configuration for inducing a vortex of a water stream flowing between said inlet
3 and outlet ports.

1 6. The microwave water heating system as in claim 5 further comprising:
2 a float valve positioned in said inner housing adjacent said inlet port and movable
3 between a sealed configuration nested in said inlet port and an unsealed
4 configuration displaced from said inlet port according to upstream and
5 downstream water pressure differential; and
6 a compression spring mounted in said inner housing and coupled to said float valve for
7 normally biasing said float valve toward said sealed configuration.

1 7. The microwave water heating system as in claim 1 wherein:
2 said casing and said inner housing include generally spherical configurations;
3 said magnetron includes a plurality of magnetrons spaced apart about said casing,
4 whereby transmission of microwaves thereby are centrally focused toward said
5 inner housing.

1 8. The microwave water heating system as in claim 1 further comprising means
2 connected to said inlet port for circulating water from said water source through said
3 magnetron for cooling said magnetron.

1 9. The microwave water heating system as in claim 1 wherein said casing and
2 said inner housing include a partially flattened spherical configuration.

1 10. The microwave water heating system as in claim 1 wherein said casing and
2 said inner housing include a generally linear configuration.

1 11. The microwave water heating system as in claim 1 wherein said casing outer
2 wall includes a reflective inner surface for reflecting microwaves toward said inner housing.

1 12. A microwave water heating system for heating a water stream on demand,
2 comprising:
3 a metal casing including an outer wall having a generally spherical configuration, said
4 outer wall defining first and second openings and a casing chamber disposed
5 therebetween;
6 an inner housing positioned in said casing chamber having a generally spherical
7 configuration, said inner housing including an inlet port extending through said
8 first opening for connection to an upstream water source and an outlet port
9 extending through said second opening for connection to a downstream conduit,
10 whereby a water stream selectively flows through said inner housing between
11 said inlet and outlet ports; and
12 a plurality of magnetrons mounted about said outer wall of said casing and positioned
13 in spaced apart relationship for transmitting microwaves into a center location of
14 said inner housing for heating the water stream.

1 13. The microwave heating system as in claim 12 wherein said inner housing
2 includes an outer wall that is spaced apart from said casing outer wall so as to form an
3 intermediate space therebetween, said intermediate space being a vacuum.

1 14. The microwave heating system as in claim 13 wherein:
2 said casing outer wall includes a reflective inner surface for continuously reflecting said
3 microwaves toward said inner housing; and
4 said inner housing includes a construction that is penetrable by microwaves.

1 15. The microwave water heating system as in claim 13 wherein said inner
2 housing includes a nozzle connected to said outlet port for fluid communication therewith,
3 said outer wall of said inner housing and said nozzle having a configuration for inducing a
4 vortex in the water stream prior to the water stream being discharged through said nozzle to
5 said outlet port, whereby the water stream is heated by said microwaves at said vortex.

1 16. The microwave water heating system as in claim 15 further comprising a
2 float valve positioned in said inner housing adjacent said inlet port and movable between a
3 sealed configuration nested in said inlet port and an unsealed configuration displaced from
4 said inlet port according to upstream and downstream water pressure differential.

1 17. The microwave water heating system as in claim 16 further comprising a
2 spring mounted in said inner housing and connected to said float valve for biasing said float
3 valve toward said sealed configuration.

1 18. The microwave water heating system as in claim 16 further comprising
2 means interconnecting said inlet and outlet ports for circulating water through said plurality
3 of magnetrons, whereby to transfer heat generated by said plurality of magnetrons to the
4 water stream at said outlet port.

1 19. A microwave water heating system for heating a water stream on demand,
2 comprising:

3 a metal casing including an outer wall having a generally spherical configuration, said
4 outer wall defining first and second openings and a casing chamber disposed
5 therebetween;

6 an inner housing positioned in said casing chamber having a generally spherical
7 configuration, said inner housing including an inlet port extending through said
8 first opening for connection to an upstream water source and an outlet port
9 extending through said second opening for connection to a downstream water
10 conduit, whereby a water stream selectively flows through said inner housing
11 between said inlet and outlet ports;

12 wherein said inner housing includes an outer wall spaced apart from said casing outer
13 wall so as to define a space therebetween, said space being a vacuum;

14 a plurality of magnetrons mounted about said outer wall of said casing and positioned
15 for transmitting microwaves into said inner housing for heating the water stream;

16 wherein said inner housing includes a nozzle connected to said outlet port for fluid
17 communication therewith, said outer wall of said inner housing and said nozzle
18 having a configuration for inducing a vortex in the water stream prior to the water
19 stream being discharged through said nozzle and said outlet port, whereby the
20 water stream is heated by said microwaves at said vortex.

1 20. The microwave water heating system as in claim 19 further comprising a
2 float valve positioned in said inner housing adjacent said inlet port and movable between a
3 sealed configuration nested in said inlet port and an unsealed configuration displaced from

4 said inlet port, said float valve moving between said sealed and unsealed configurations
5 according to a water pressure difference upstream and downstream of said float valve.

1 21. The microwave heating system as in claim 20 further comprising a spring
2 mounted in said inner housing and connected to said float valve for biasing said float valve
3 toward said sealed configuration.